



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

236. Proposed by L. SHIVELY, Mt. Morris College, Mt. Morris, Ill.

Sum to infinity the series $\frac{n^2}{(n+1)!}$ beginning with $n=1$.

GEOMETRY.

257. Proposed by G. I. HOPKINS, A. M., Manchester, N. H.

Construire un triangle équilatéral sachant qu'il doit s'appuyer par ses trois sommets sur trois circonférences concentriques données. *Rouché et Comberousse.*

258. Proposed by B. F. FINKEL, A. M., Professor of Mathematics, Drury College, Springfield, Mo.

Prove that the tangents to an ellipse from any external point subtend equal angles at the focus, by means of the formula $\tan \phi = (m_1 - m_2) / (1 + m_1 m_2)$, where ϕ is the angle between the focal radius of either of the points of tangency and the line joining the focus and the external point, and m_1 and m_2 are the slopes of these two lines.

259. Proposed by R. D. CARMICHAEL, Hartselle, Ala.

Given three non-intersecting circles; to draw eight tangent circles, each tangent to all three of the given circles.

CALCULUS.

196. Proposed by F. P. MATZ, Sc. D., Ph. D., Reading, Pa.

The shortest tangent intercepted by the axes of the ellipse to which the tangent is drawn, equals the sum of the semi-axes of the ellipse.

197. Proposed by R. D. CARMICHAEL, Hartselle, Ala.

$$\int_0^\infty \frac{\sin mx \cos nx}{x} dx.$$

189. Proposed by M. E. GRABER, A. M., Heidelberg University, Tiffin, O.

Show that $e \int_1^\infty, \varepsilon^2 \int_2^\infty, \dots, \varepsilon^n \int_n^\infty, \dots$ are integers divisible by $(p+1)!$, when

the expression under the integral is $Z^p \left[(z-1) \dots (z-n) \right]^{p+1} e^{-z} dz$.

MECHANICS.

178. Proposed by F. ANDEREGG, A. M., Professor of Mathematics, Oberlin College, Oberlin, O.

A weight W is drawn up a rough conical hill of height h and slope α . and

the path cuts all the lines of greatest slope at the constant angle β . Find the work done in attaining the summit.

[Problem 11, page 226, *Johnson's Theoretical Mechanics*.]

179. Proposed by F. P. MATZ, Sc. D., Ph. D., Reading, Pa.

If the *velocity* of a body moving under an acceleration tending to the center *varies* as the radius of curvature, the body will describe a cycloid.

MISCELLANEOUS.

145. Proposed by F. P. MATZ, Ph. D., Sc. D., Reading, Pa.

Given $\sin 3\phi + \cos 3\phi = m$(1), and $\cos \phi - \sin \phi = x$(2), to find *x* extremes of *m*.

AVERAGE AND PROBABILITY.

163. Proposed by E. D. CARMICHAEL, Hartselle, Ala.

In a regular *n*-gon a triangle is formed by taking three vertices at random. What is the mean value of the triangle.

164. Proposed by J. O. Mahoney, B. E., M. Sc., Central High School, Dallas, Texas.

If *m* is prime, and the numbers 0, 1, 2, 3,....., $m^2 - 1$ are placed at random in the form of a square, the probability that the square is *hyper-magic* is

$$\frac{(m-1) m}{(m^2-2)!}$$

NOTE.—Problems and solutions in the departments of Geometry, Calculus, Mechanics, and Average and Probability should be sent to B. F. Finkel; and those in the departments of Algebra, Diophantine Analysis, Miscellaneous, and Group Theory should be sent to Dr. Saul Epstein. Our contributors should carefully observe this notice if proper credit for contributions is to be given.

NOTES.

The Chicago Section of the American Mathematical Society met in Chicago on April 29. E.

Mr. Newton Ensign, of McKendree College, a student of our well known contributor Prof. G. W. Greenwood, was awarded the Rhodes Scholarship for Illinois. He will pursue the honor mathematical course at Oxford University. E.

The Open Court Publishing Co., of Chicago, has just issued a portfolio of twelve portraits of eminent mathematicians, edited by Professor David Eugene Smith. It includes the portraits of DeCartes, Pythagoras, Archimedes, Fermat,